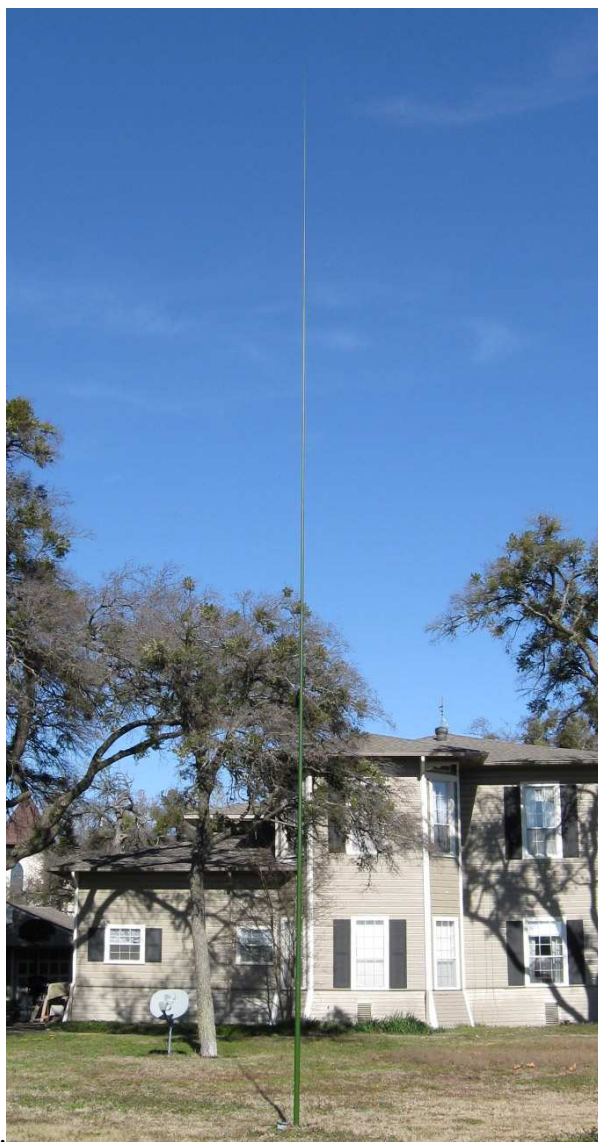




Model S9v

43' Multiband Vertical Antenna

Installation Guide



**WARNING: INSTALLATION OF THIS
PRODUCT NEAR POWERLINES IS
DANGEROUS. FOR YOUR SAFETY,
FOLLOW THE INSTALLATION
DIRECTIONS.**

INTRODUCTION

Thank you for purchasing the S9v 43', a high-performance lightweight telescoping fiberglass vertical designed for Amateur Radio use from 80 through 6 meters. We believe the S9v 43' (hereinafter also referred to as the S9v) to be the best value in a high-performance 'tall' vertical and we sincerely hope that you enjoy your antenna.

Please read this guide in its entirety **FIRST** before installing your S9v. The S9v is easy to install and deploy, but reading through this guide first will make it a painless and enjoyable experience.

BEFORE YOU GET STARTED...

The S9v 43' consists of rugged, telescoping fiberglass tubes with a continuous, insulated vertical element wire inside the tubes. The base tube functions as a hard shell case, protecting the collapsed fiberglass sections. The antenna is shipped with heavy-duty rubber end caps to retain the telescoping sections.

The antenna is shipped with all the components and hardware you need to install it, including a heavy-duty stainless steel pipe mount clamp. You will need to furnish a Phillips head screwdriver, coax cable, an antenna tuner, a 4:1 unun or 1:1 current choke balun, a 54" long x 1-1/2" galvanized plumbing pipe (1.9" max OD) for the ground mount, some radials, and weatherproofing material.

Coax Cable

For top performance, the antenna should be fed with a high quality, low-loss 50 Ohm coaxial feed line such as RG-213 or LMR 400. Less expensive coax such as RG-8x is also perfectly adequate for short coax runs of 50 feet or less.

Antenna Tuner

The S9v requires an antenna tuner in your shack or remotely located at the antenna feed point. (Internal rig tuners do not have adequate range to match the higher impedances presented by the antenna.)

Using a weatherproofed remote antenna tuner at the antenna feed point ensures absolute lowest signal loss and best overall multi-band performance. When a remote tuner is used at the antenna feedpoint, a 4:1 unun is typically not required. However, a 1:1 current choke balun may be needed between the remote tuner and your transmitter if you experience RF current in your shack. (Burying your coax cable also helps minimize RF current from flowing back into your shack.)

The S9v 43' is surprisingly effective on 6 meters, assuming your tuner covers 6. In casual testing, a ground mounted S9v 43' consistently outperformed a monoband 6 meter Slim Jim elevated at 40 feet. You will enjoy good local 6 meter FM coverage plus the excitement of 6 meter DX when Sporadic E propagation occurs on 6 meters.

Unun/Balun

Coax Run Longer than 50 Feet - A 4:1 "unun" is recommended at the antenna feed point (unless you are using a remote antenna tuner) for coax runs longer than 50 feet. A 4:1 unun helps match the impedance presented by the antenna to your coax feed line. S9 recommends the Balun Designs "4:1 Unun for Verticals" (Model # 4134).

Coax Run 50 Feet or Less – If you are using a quality antenna tuner and have a coax run of 50 feet or less, a quality 1:1 current choke balun will suffice.

Ground Mount Pipe

A 54-inch long (minimum) section of standard 1-1/2 inch galvanized plumbing pipe (1.9" OD) is required for the S9v 43' ground mount. Elevated mounting configurations are not recommended due to the size of this antenna. A rubber o-ring and stainless steel saddle clamp is included with the antenna to keep the base of the antenna off of the ground.

Hardware stores such as Home Depot™ and Lowes™ stock 1-1/2" galvanized plumbing pipe in their plumbing departments. Most hardware stores also have a pipe cutting machine and they will cut your pipe to 54 inches or longer upon request.

Radials

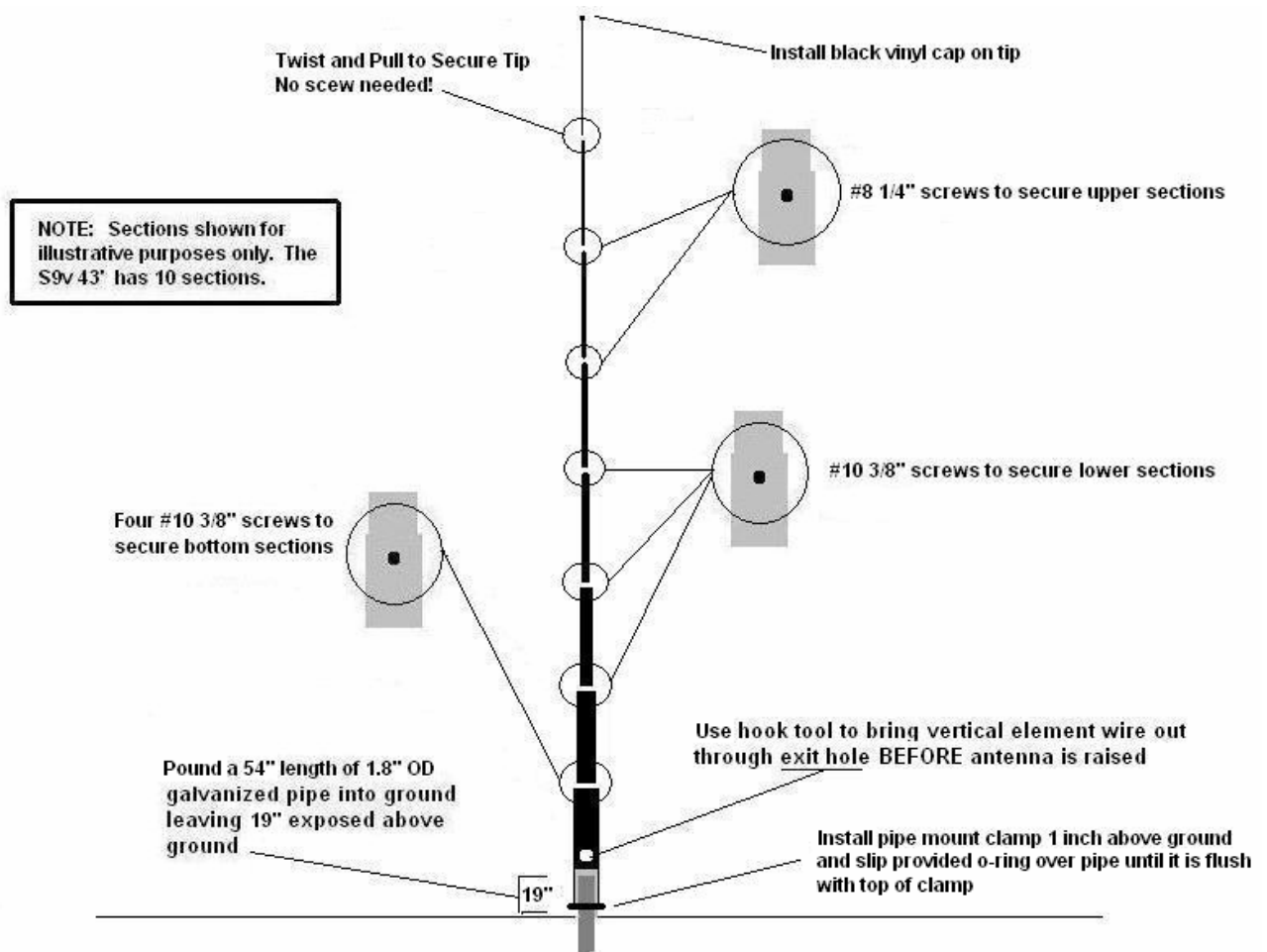
For optimum performance, the S9v must be used with a good RF ground, normally achieved using radial wires. A general rule of thumb for radial wires is: "longer" and "more" is better and "some" are better than "none". A ground rod is not a suitable RF ground.

We recommend at least 16 radials, with each radial at least 0.2 wavelength at the lowest operating frequency: If you have the time and resources, 32 or more radials at least 0.2 wavelength long (or longer) should be considered. There is no precise formula to calculate the length of ground-mounted radials because everyone has different soil and soil tends to change the electrical length of the radials. That said, the following table contains suggested lengths for 0.2 wavelength radial wires for 80 and 40 meters:

Band	Frequency	Minimum Radial Length
80 Meters	3.5 MHz	53.5 feet long (53 feet, 6 inches)
40 Meters	7 MHz	26.75 feet long (26 feet, 9 inches)

It is highly recommend that you use a radial plate to connect and organize your radials and to provide the vital ground connection for your coax shield. The optional S9 Radial Plate (or, our PRO Radial Plate) has 36 radial mounting holes - enough to easily connect 80 radials to the plate. Additional, detailed information on radials can be found on page 16.

INSTALLATION – QUICK REFERENCE



INSTALLATION – DETAILED INSTRUCTIONS

1. **Select the Site.** Try to use a clear and open area to deploy the antenna.
Even though the antenna is double-insulated, you absolutely MUST locate the antenna site at least 65' away from power lines (1.5x the length of the antenna). In fact, an ideal installation site would be a least 65' away from *any* other large object such as a house or trees.
2. **Install the Ground Mount Pipe.** The antenna requires a ground mount pipe. You will need a large hammer, a spare piece of wood and a level.



IMPORTANT!

Place a piece of wood over the top of the pipe to protect the top edges from becoming deformed. Hammer the piece of wood in a straight downward direction. Do NOT directly hammer the pipe – hammer the wood to protect the pipe.

Drive the 1.9" maximum OD x 54-inch (minimum length) pipe into the ground leaving 19 INCHES exposed above the ground.



19 inches from
ground to top of
pipe

NOTE: Use a level while you are installing the pipe to ensure that it is as straight as possible in the vertical plane.

3. **Install the Radial Plate and Pipe Mount Clamp.** After you have installed the ground mount pipe, install the radial plate. (The S9 Radial Plate or S9 PRO Radial Plate simply slips over the pipe and rests on the ground.)

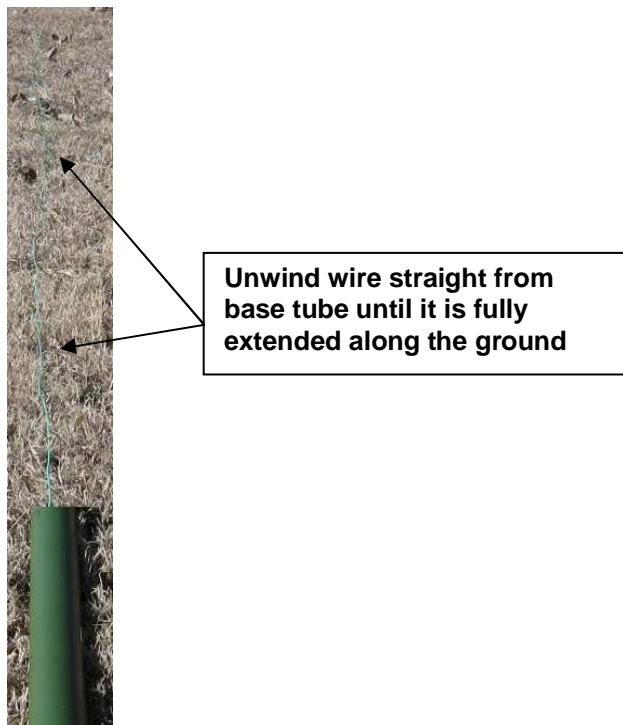
Next, secure the provided stainless steel pipe mount clamp to the ground mount pipe about 1-inch above the ground and then slip the provided rubber o-ring down over the pipe until it sits on the flat saddle portion of the clamp. (The o-ring acts as a cushion for the base of the antenna, as shown on page 13.)



4. **Assemble the Antenna.** To assemble the antenna:

- a. Lay the antenna on the ground with the base tube near the ground mount pipe and unwind the vertical element wire from the base tube. Now, “walk the wire” away from the antenna base tube in a straight line. Don’t pull on the wire – the idea is to just un-roll the wire to its full length. Once the wire is completely unrolled, you can pull small sections of the wire through your hands to straighten the wire.

NOTE: The wire does NOT have to be perfectly straight, so don’t spend a lot of time trying to straighten the wire!



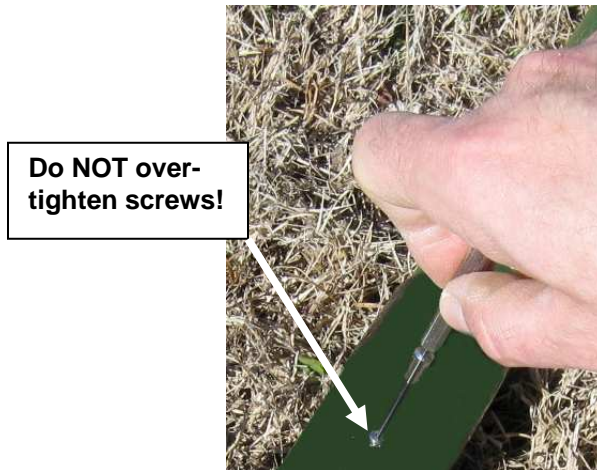
- b. Next, remove both the top and bottom rubber caps. Put these caps in your pocket so that they will not be lost in the grass!

- c. Now, we are ready to extend the antenna. The antenna should still be laying flat on the ground. To extend the antenna, grab a section of the wire near the bottom plastic cap and push the wire into the base tube. This action should cause the top, thinnest section of the antenna (it has shrink wrap tubing on the tip) to pop out of the top of the base tube. If this doesn't work, pick-up the base tube and shake it slightly while pointing the top part of the tube downward to shake out the top section.



Grab top section here and pull straight out. (Cap is installed in step g, below)

- d. Gently pull the top section straight out of the base tube (pull the section, not the tip). Now, pull the next, lower section straight out.
- e. All of the sections except the top, tip section are pre-drilled to accept the provided stainless steel screws. Again, the top (tip) section does not require a screw. Twist and pull on the sections until the black mark on the upper section aligns with the pre-drilled screw hole in the lower section. At this point, the pre-drilled holes in both sections will be aligned.
- f. After you have fully extended the antenna and aligned all of the screw holes, use a Phillips screwdriver to install the screws. DO NOT OVER-TIGHTEN the screws as it is not necessary to make the screws extremely tight. Starting from the bottom of the antenna, use the larger #10 3/8" long screws for the first 10 holes. Three of the smaller #8, 1/4" long screws are used to secure the upper sections.

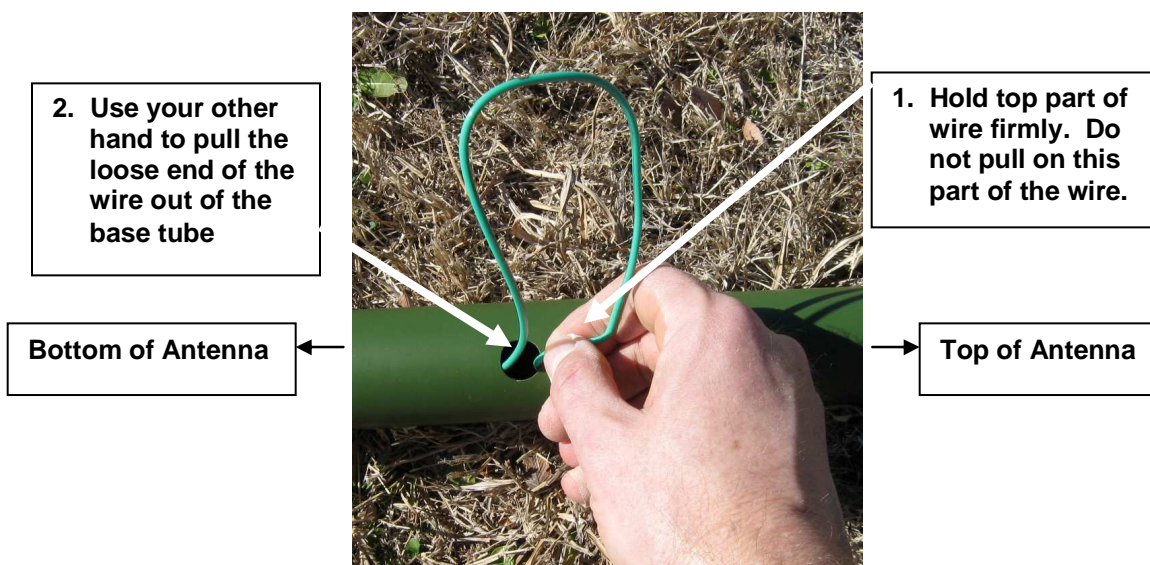


NOTE: The antenna should now be fully extended and laying on the ground and all sections should be secured with the stainless steel screws (except the top, tip section which does not require a screw).

- g. Place the provided black vinyl cap on the tip of the antenna.
- h. As you extended and secured the sections, the vertical element wire may have disappeared inside the bottom of the base tube. Now, let's retrieve the vertical element wire from the base tube. Rotate the base tube until you see the wire exit hole which is located about two feet up from the bottom of the antenna.
- i. Use the supplied hook tool to grab the wire and then gently twist the tool clockwise to pull the loose (bottom) end of the wire toward the hole.



- j. Refer to the figures, below. Pull a small U-shaped portion of the wire through the exit hole and STOP. Carefully remove the hook tool. Then, hold the top part of the wire firmly in one hand while you use your other hand to pull the bottom loose end of the wire out through the exit hole. Do not pull on the top part of the wire – just pull on the lower, loose end!



5. Raise the Antenna.***WARNING!***

For safety reasons, do not attempt to raise (or lower) the antenna when winds are above 10 MPH.

It is strongly recommended that you use a helper to raise the antenna to prevent injury to yourself and to avoid damaging the antenna.

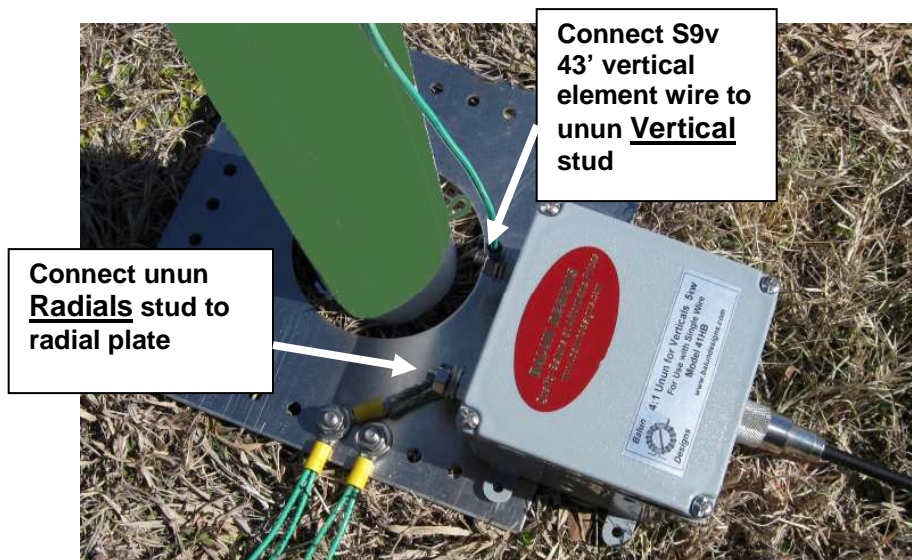
- a. To raise the antenna, position the antenna on the ground so that the tip of the antenna is pointing toward the wind. (You should walk the antenna up with the wind at your back.)
- b. Now, position the antenna until the bottom of the antenna base tube is near the pipe mount clamp.
- c. Next, have your helper stand next to the ground mount pipe and have him/her put some very light foot pressure on the end of the base tube to keep the antenna from moving while you raise it.
- d. Now, walk into the wind, about $\frac{3}{4}$ of the way toward the tip of the antenna and pick up the antenna. Slowly lift the antenna up and start walking toward the ground mount pipe. Your helper should maintain very light foot pressure on the base tube to help stabilize the antenna and to keep the base of the antenna on the ground as it is raised. Continue to walk the antenna up into the vertical position. The wind, if any, should be at your back to make this as easy as possible.
- e. Once the antenna is in the vertical position, have your helper kneel down and grab the bottom of the base tube and then together, lift the antenna straight up and gently slip it down over the ground mount pipe until the bottom edge of the base tube rests on the rubber o-ring, as shown below.



6. **Connect Antenna to Unun/Balun or Remote Antenna Tuner.**

- a. Position the 4:1 unun, 1:1 choke balun or remote antenna tuner at the base of the antenna and connect the antenna vertical element wire ring terminal connector to the unun/balun stud marked **Vertical** (or tuner connection marked **Antenna**).

Next, solder two ring terminal connectors to a short piece of radial wire or tinned copper braid and connect the unun/balun **Radials** stud to any convenient hole on the radial plate (or connect the remote antenna tuner **Ground** connection to any hole on the radial plate). This lead should be kept as short as possible. Finally, connect your coax feed line male PL-259 connector to the unun/balun or remote antenna tuner female SO-239 connector.



- b. Use electrical tape to secure the vertical element wire below the base tube exit hole. If there is any slack in the vertical element wire, it should be left **ABOVE** the electrical tape. This way, there will be some slack wire available to move with the fiberglass sections in the event of very strong wind.



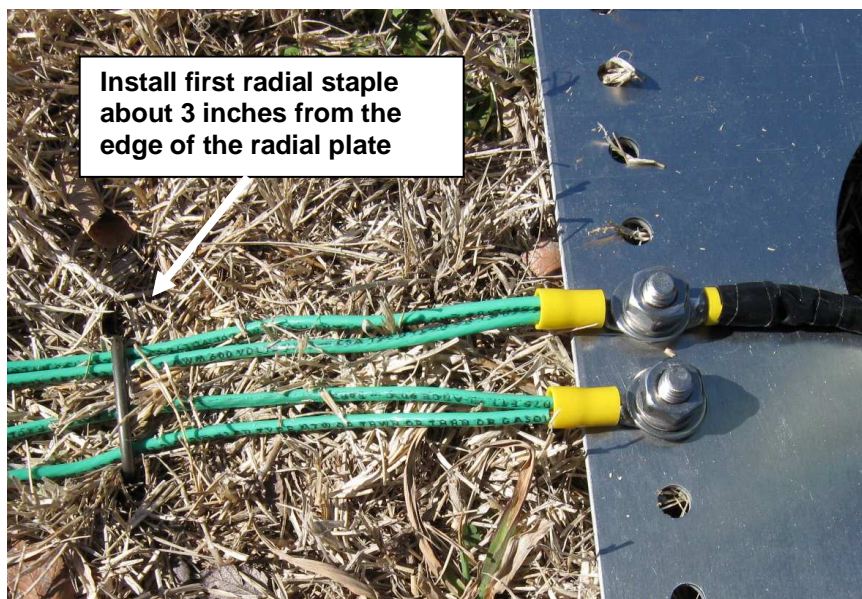
Leave wire slack
above tape

- c. COMPLETELY weatherproof the vertical element wire connection and all coax feed line and unun/balun connections using the sealant of your choice such as coax seal, silicon RTV, etc.

NOTE: It is not necessary to weatherproof the ring terminal connections on the radial plate.

7. **Install Ground Radials.** We recommend a minimum of 16 radials, each at least 0.2 wavelength long at the lowest operating frequency, spaced as evenly as possible around the antenna base – like wheel spokes. For best performance, use 32 (or more) radials. It is suggested that you use 14 AWG insulated stranded copper wire (available at Home Depot™ and sold in 500-ft rolls for around \$30).

Use lawn and garden fabric staples to secure the radials to the ground. Install the first staple about 3 inches or so from the edge of the radial plate. Grass will eventually grow over the radials and cover them. In the meantime, be sure to set your lawn mower blade higher than normal to ensure that the radials do not get caught in the mower blade - this advice comes from real-world "experience" (!). It is best to use lots of staples for each radial to ensure that the radials are held firmly against the ground.



LOWERING THE ANTENNA

The antenna should perform in winds up to around 40 MPH. Ice is definitely a concern for any antenna. If winds above 40 MPH and/or ice are expected, you must lower the antenna to protect it from becoming damaged.

WARNING!

For safety reasons, do not attempt to lower (or raise) the antenna when winds are above 10 MPH.

Two people are recommended to lower the antenna to prevent injury to yourself and to prevent damage to the antenna.

To lower the antenna:

1. Disconnect the vertical element wire from the unun/balun or remote antenna tuner.
2. While standing opposite each other, your helper should grab the bottom of the base tube near the pipe mount clamp.
3. Keep your back to the wind and grab the base tube higher up – near shoulder level.
4. Working together, carefully lift the antenna straight up and off of the pipe and then quickly lower the bottom of the base tube straight to the ground, keeping the antenna as straight as possible in the vertical plane.
5. Now, have your helper apply light foot pressure to the bottom of the base tube to keep it on the ground as you slowly walk the antenna down into the wind.

MAINTENANCE

The S9v requires little, if any, maintenance. The S9v is finished with a durable painted surface, but it is subject to oxidation – just like an aluminum antenna. If you notice oxidation (color becomes lighter), use a soft cloth and Armor All™ to restore the finish. Automotive spray wax is also an excellent product to seal and protect the finish. The antenna may also be repainted, if desired, using a quality exterior spray paint such as Krylon™ or Rustoleum™.

SUPPORT

If you have any questions or problems installing or using your S9v, please contact us. If your antenna becomes damaged, replacement fiberglass sections are available from S9 at reasonable cost.

You can reach us via email at: john@s9antennas.com or feel free to call us at 469-426-8554 from 8 AM to 6 PM CST M-F.

Our mailing address is:

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Good DXing!